GUITAR SYNTHESIS

Explaining GR & VG

Guitarists aren't known for their love of technology. Yet thanks to Roland's intuitive approach to guitar synthesis, it really needn't be that way. WORDS: PAUL WHITE

Guitar synthesis has been with us for around a quarter of a century, yet for many players it's still an area surrounded by mystery. What's worse, many of the technical 'issues' (ie problems) that applied to earlier generations of guitar synths are still assumed to be true of today's products.

Not so. The fact of the matter is that guitar synthesizers are easier to play, better sounding and less expensive than at any time in their history. On an artistic level, that means guitarists have the opportunity to easily access and use sounds and styles more often associated with keyboards.

The Roland GR-33 guitar synth (below) and the Roland VG-88 guitar modelling system (bottom)

GOTTA LOTTA PICKUP

Roland's approach to guitar synthesis is to use a special divided pickup, the GK-2A, which drives a number of different synth modules. You can fit the MIDI pickup to pretty much any electric guitar with a minimum of fuss, and there's also the GK-2B variant for bass.

Alternatively, many high-profile electric and acoustic guitar companies sell models that are fully GK compatible from the off. There's a full list in News this issue, though Fender's Standard Series Roland-Ready Strat is perhaps the best-known.

The reason a divided pickup is necessary is that the output from each guitar string must be processed separately in order to convert the string pitch into a corresponding synthesizer pitch (and to provide a MIDI output for driving other MIDI sound sources if required). This process is known as pitch tracking, and contrary to some myths, there's no significant tracking delay on today's models though this flaw was present in earlier instruments.

Tracking accuracy is also much improved, so while you do have to play cleanly, there are no special techniques to learn other than perhaps the use of a Hold pedal to create indefinite sustain.

In my own studio and for live performance I use a Roland GR33 guitar synthesizer, which has the advantage of being built into a compact floor unit that combines footswitches for changing sounds or affecting the performance; a pedal that can be used to control functions such as volume or other parameters, and a whole library of high quality on-board sounds derived from Roland's ever-popular JV-series instruments.

Aside from a GK-2A-equipped guitar you don't need anything else to play first-class synth sounds, though if you can plug your guitar synth into a

separate keyboard amp or PA with a full-range frequency response, you'll find you get better synth sound reproduction than choosing to plug into a regular guitar amp alone.

From GR to VG

What I've described so far is guitar synthesis – a system by which guitar players can access keyboard-style sounds in a convenient way. However, Roland also developed another kind of synthesis using the GK-2A pickup, which is very different. I'm referring here to the VG guitar modelling products which work on a very different principle to the GR synths, even though the pickup system is the same.

Instead of measuring the guitar's pitch and using this to trigger a synthesizer sound source, the VG uses COSM (Composite Object Sound Modelling) to reshape the harmonics produced by the guitar string in a number of different ways.

The main use of COSM is to make one type of guitar sound like another, or even to 'model' different pickup arrangements, after which you can simulate different guitar amplifiers, speaker cabinets and even studio miking arrangements. This way, a single GK-equipped guitar can sound like virtually any guitar played through any amplifier, which is a step on from most modelling guitar amps.

Play, don't trigger

It's vital to understand that the VG system creates all these sounds using the output from the GK-2A pickup, rather than triggering samples of guitar sounds. What that means is that as your playing style changes, so does the sound – just like a regular guitar played through a regular amp. While a guitarist who always works with one guitar and one favourite sound is unlikely to be convinced by COSM modelling, a VG floor unit or amplifier is ideal for gigging players who need to change sounds completely from song to song.

The development doesn't stop there though, because Roland's engineers discovered they could reshape the guitar sound into something reminiscent of a keyboard synthesizer, by doing more radical processing on the sounds picked up by the GK-2A pickup. What's more, you still retain the guitar's ability for expression and playing sensitivity.

This form of harmonic remodelling is known as HRM and several HRM voicings are included in all VG instruments – perhaps most spectacularly in the Roland V-Bass system, which not only models electric, acoustic and fretless basses, but can also create abstract sounds that combine the characteristics of instruments such as cellos and bowed basses with electronic synthesis. Again, there are no samples – what you hear is the sound of the guitar or bass string itself after some heavy-duty processing, meaning it's still connected directly to your picking style.

Some people have criticised the VG instruments for not having a MIDI output that carries MIDI note information, but that's to miss the point. The VG doesn't rely on pitch tracking any more than a fuzz box does, yet nobody would expect MIDI note information to come out of a fuzz box!

Synth stompers

One major benefit of Roland's research into guitar synthesis is that the GK-2A pickup has become pretty much the industry favourite, supported even by products from other manufacturers. Because of this it's been possible to develop a range of more cost-effective, stompbox-style effects that also use the GK pickup as a source.

Though these may look like simple stompers, they can create sounds and effects that simply wouldn't be possible without a split pickup. For example, you can have independent octave splitting for each string with none of the side-effects of conventional pitch shifting, and on top of that you can opt to have octaves only on specific strings.

In addition, you can transform guitar sounds into sitars and there are HRH synth sounds reminiscent of early analogue guitar synths, all controlled by easy-to-operate knobs. This is an exciting avenue for me because, having tried some of the first generation of GK stomp boxes, I can see huge possibilities for this technology, enabling guitarists to experiment with unusual sounds without having to get involved with traditional synthesis. From where I'm standing, GK-powered sound has a very interesting future.

Fitting the GK pickup

The GK pickup can be fitted via the supplied sticky pads and spacers, or using the included screws and springs. For serious use, I'd recommend using the screws as they make precise adjustment so much easier. If you're worried about damaging your guitar, it's possible to buy a replacement scratchplate and screw through this into the body. If you ever come to sell the guitar, you can just replace the original scratchplate to cover the screw holes.

It's very important to mount the pickup close to the bridge and to set the string spacing as advised in the manual. After that, there's a simple setup procedure to match the sensitivities of the strings to each other, then you're ready to play.

You can either fit the GK-2A to your existing guitar, or Fender's Roland-Ready Strat comes with everything you need pre-installed